Worksheet 1 Structure of the internet
Unit 5 Networks and web technologies
PG ONLINE

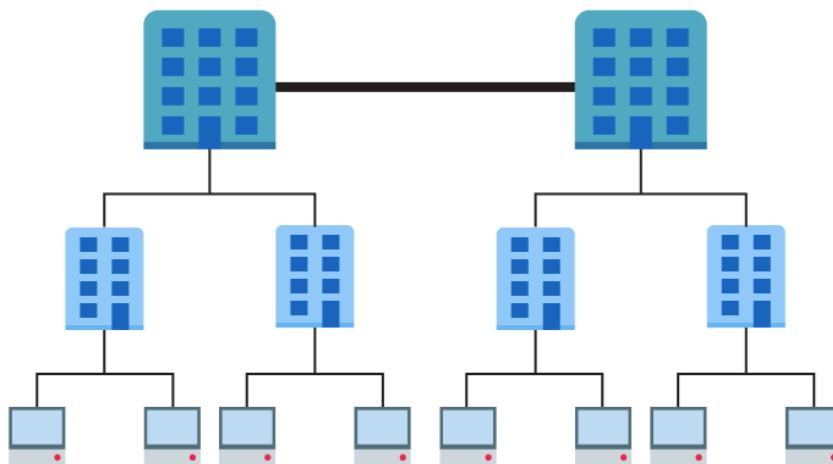# Worksheet 1 Structure of the internet

Task 1

1. Define the following Computing terms:

   a. The Internet

   b. World Wide Web

   c. Backbone

2. Label the diagram of the structure of the different levels of the Internet, showing DNS servers, backbone, ISP servers, home, organisation and business users

3. IP version 4 addresses such as 13.1.67.234 and 115.90.12.101 are used to identify devices on a network. As such they need to be unique for each device.

   a. The value of each number in an IP address ranges from 0 to 255. Calculate how many addresses are possible in theory.

   b. Explain why version 4 is not enough for use on the Internet.

Task 2

1. IP addresses are difficult for humans to remember. DNS provides a resolution of domains names and the IP addresses.

   If you type 216.58.213.174 into the address bar of your browser, you should get the www.google.co.uk webpage.

   We type the URL as it is easier to remember but it is just a label for the actual IP address that connects your computer to the Google servers.

   Use the website http://ping.eu/nslookup to find the IP addresses of the following three websites and two more of your choice:

Website	IP address
google.co.uk	
bbc.co.uk	
en.wikipedia.org	

   Check they work by typing them into a browser address bar. (Some only work in one direction.)

   Compare your results with other people. They may be different. Can you explain why?

2. URLs are used to specify the location and means of accessing a resource across a network.

   Correctly label the parts of the following URL with '**Domain name**', '**Protocol**', '**Resource**':

   # http://foodsupermarket.com/cheeses.html

Task 3

Read the following explanation of "physical" vs "logical" network topologies:

A "bus" is simply a wire or cable. At its simplest, a bus network is just two computers linked together by a wire. You can add more computers and join more computers to the bus network, but only one computer can use the bus at any one time.

In an Ethernet network, computers use a collision detection algorithm called CSMA/CD (Carrier Sense Multiple Access/Collision avoidance) to deal with this problem.

If the wire is too long, the signal degrades, so **hubs** were inserted to act as repeaters at various points. This allowed many **physical** buses to act like one **logical** bus.

It did not solve the problem of collisions, in fact it made the problem worse because it was easy to add more computers to the network.

If the **hub** is replaced by an intelligent **switch**, the switch knows which of the physical buses is attached to it, so a signal is sent only to the buses that the destination computer is attached to.

So what you now have is a number of computers connected to a switch – which, hey presto, is a physical star network! But it is still using a bus protocol, so it is a logical bus network.

Explain in your own words the difference between a logical and physical topology.

Task 4

Advantages and disadvantages of each topology

BUS TOPOLOGY:

Advantages	Disadvantages

STAR TOPOLOGY:

Advantages	Disadvantages